



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

These values satisfy condition (2).

Substituting in (1) we have

$$a^2 - b^2 = 1 \dots (3).$$

If  $e$  is the eccentricity of the ellipse  $b^2 = a^2(1 - e^2)$ , substituting in (3) and reducing, we have  $ae = \pm 1$ , i. e. the foci of the ellipse are at the points  $\pm 1$ .

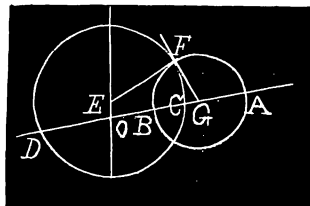
Also solved by G. B. M. ZERR, and the PROPOSER.

140. Proposed by J. OWEN MAHONEY, B. E., M. Sc., Professor of Mathematics, Central High School, Dallas, Tex.

Having given two points on a range and a point that bisects the distance between two other points that form an harmonic ratio with the given points, give, if possible, a geometrical construction for locating the other two points.

Solution by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

Let  $A, B$  be the two given points on the range,  $O$  the point bisecting the distance between the other two points. Through  $O$  draw  $OE$  perpendicular to  $ABO$ , and on  $AB$  as diameter describe a circle  $AFB$ . Draw  $EF$  tangent to  $AFB$ , and with  $E$  as center and a radius equal to  $EF$  describe a circle cutting  $AO$  in  $C$  and  $D$ . ( $F$  is the point of tangency of  $EF$ , and  $EF$  must be greater than  $EO$ ). Then  $C, D$  are the two points required.



For  $GF^2 = AG^2 = GC \cdot GD$ .

$\therefore AG : GC = GD : AG$ .

But  $AG + GC : AG - GC = GD + AG : GD - AG$ .

$\therefore AC : CB = AD : BD$ .

Q. E. D.

141. Proposed by M. A. GRUBER, A. M., War Department, Washington, D. C.

The equilateral triangle described on the hypotenuse of a right triangle is equivalent to the sum of the equilateral triangles described on the other two sides.

Prove without the aid of the famous Pythagorean proposition.

Solution by J. SCHEFFER, A. M., Hagerstown, Md., and NELSON L. RORAY, Bridgeton, N. J.

Let  $ABC$  represent the right triangle, and  $D, E, F$  the vertices of the equilateral triangles constructed on the three sides.

It is seen at once that  $\triangle ACF = \triangle BCE = \frac{1}{2} \triangle ABC$ .

$\therefore \triangle ACF + \triangle BCE = \triangle ABC$ .

$\triangle BDC = \triangle ABF$ ,  $\triangle ADC = \triangle AEB$ .

$\therefore \triangle ABD + \triangle ABC = \triangle ABF + \triangle AEB$ .

$\triangle ABC = \triangle ACF + \triangle BCE$ .

$\therefore \triangle ABD + 2\triangle ABC = (\triangle ABF + \triangle ACF) + (\triangle AEB + \triangle BCE)$ .

$\therefore \triangle ABD + 2\triangle ABC = \triangle BCF + \triangle ABC + \triangle ACE + \triangle ABC$ .

